IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

1. (Previously Presented) A radio communication apparatus comprising:

a detection section that detects adaptability to spatial multiplexing transmission for each divided band, each divided band being obtained by dividing a communication band for multicarrier transmission and each divided band including a plurality of subcarrier signals; and

a setting section that sets, for each divided band, a respective transmission format including a spatial multiplexing number used to carry out radio transmission based on the adaptability detected for said each divided band.

2. (Previously Presented) The radio communication apparatus according to claim 1, wherein said detection section detects the adaptability based on an average spatial spread of an arriving path of said plurality of subcarrier signals included in the divided band.

3. (Original) The radio communication apparatus according to claim 2, wherein said detection section comprises:

a correlation calculation section that calculates a correlation value between a pilot signal embedded in said plurality of subcarrier signals and a replica of said pilot signal; and

an adaptability function calculation section that calculates adaptability for said each divided band based on the calculated correlation value.

4. (Original) The radio communication apparatus according to claim 3, wherein said detection section further comprises a generation section that generates a correlation matrix for said each divided band based on said correlation value, and said adaptability function calculation section calculates said adaptability using said correlation matrix.

5. (Original) The radio communication apparatus according to claim 4, wherein said generation section calculates a correlation matrix of a column vector corresponding to each of said plurality of subcarrier signals.

6. (Original) The radio communication apparatus according to claim 5, wherein said generation section obtains a correlation matrix for said each divided band by integrating the correlation matrix of said column vector.

7. (Previously Presented) The radio communication apparatus according to claim 4, wherein said generation section calculates said correlation matrix using the following equation:

$$Ns = \sum_{m=1}^{Nd} Nc(m)$$

where R denotes a correlation matrix, Nc denotes a number of subcarrier signals belonging to a divided band, Vn denotes a column vector corresponding to nth subcarrier signal belonging to a divided band, and H denotes a complex conjugate transposition operator.

8. (Original) The radio communication apparatus according to claim 4, wherein said adaptability function calculation section obtains adaptability including a first function value and a second function value which is different from said first function value from an eigenvalue of said correlation matrix.

9. (Original) The radio communication apparatus according to claim 8, wherein said first function value indicates reception quality, said second function value indicates said spatial spread, and said setting section sets said transmission format according to a result of a comparison between said spatial spread and a threshold which changes in conjunction with said reception quality.

10. (Original) The radio communication apparatus according to claim 3, wherein said detection section further comprises a generation section that generates a correlation vector for said each divided band based on said correlation value, and said adaptability function calculation section uses said correlation vector to calculate said adaptability.

11. (Original) The radio communication apparatus according to claim 10, wherein said generation section correlates a column vector corresponding to each of said plurality of subcarrier signals and a predetermined element in said column vector.

12. (Original) The radio communication apparatus according to claim 11, wherein said generation section obtains said correlation vector by integrating said correlation result.

13. (Previously Presented) The radio communication apparatus according to claim 11, wherein said generation section calculates said correlation vector using the following equation:

$$h_{nk} = \frac{1}{Np} \sum_{s=1}^{Np} f_{n-k}(t_0 + No \cdot (s-1))\, r^*(s)$$

where z denotes a correlation vector, Nc denotes a number of subcarrier signals belonging to a divided band, Vn denotes a column vector corresponding to nth subcarrier signal belonging to a divided band, Vn,x denotes a xth element in column vector Vn, x denotes a constant equal to or smaller than a number of reception antennas, and * denotes a complex conjugate transposition operator.

14. (Original) The radio communication apparatus according to claim 3, further comprising a path search section that detects a path timing using said pilot signals, wherein said correlation calculation section calculates a correlation value for said detected path timing.

15. (Original) The radio communication apparatus according to claim 2, wherein said detection section punctures any one of said plurality of subcarrier signals when detecting said adaptability.

16. (Original) The radio communication apparatus according to claim 2, wherein said detection section changes a bandwidth of said each divided band according to a spreading factor in a frequency axis direction.

17. (Original) The radio communication apparatus according to claim 2, further comprising:

a transmission section that transmits a plurality of subcarrier signals which belong to said communication band and in which pilot signals are embedded to a communicating apparatus; and

a reception section that receives information acquired and replied by said communicating apparatus using the pilot signals embedded in the plurality of transmitted subcarrier signals,

wherein said detection section calculates adaptability for said each divided band based on received information.

18. (Original) The radio communication apparatus according to claim 17, wherein said detection section changes the bandwidth for said each divided band according to a spreading factor in a frequency axis direction.

19. (Original) The radio communication apparatus according to claim 2, wherein said setting section determines a space multiplexing number of said communication band based on adaptability detected for said each divided band.

20. (Original) The radio communication apparatus according to claim 2, wherein said setting section determines a space multiplexing number for said each divided band based on adaptability detected for said each divided band.

21. (Original) The radio communication apparatus according to claim 2, wherein said setting section sets said transmission format as a transmission format for space multiplexing transmission and further comprises a transmission section that transmits a pilot signal when a transition occurs from a mode in which said transmission format for space multiplexing transmission is not used to a mode in which said transmission format for space multiplexing transmission is used.

22. (Original) The radio communication apparatus according to claim 2, wherein said setting section sets any one of a transmission format including a known signal and a transmission format not including said known signal.

23. (Original) The radio communication apparatus according to claim 2, further comprising an acquisition section that acquires an evaluation value on mobility of a communicating apparatus, wherein said setting section sets said transmission format based on an acquired evaluation value.

24. (Original) The radio communication apparatus according to claim 2, wherein said detection section comprises:

a correlation calculation section that calculates a correlation value between different branches in an array antenna used for space multiplexing transmission; and

an adaptability function calculation section that calculates adaptability for said each divided band based on a calculated correlation value.

25. (Original) The radio communication apparatus according to claim 24, wherein said detection section further comprises a generation section that generates a correlation matrix for said each divided band based on said correlation value, and said adaptability function calculation section calculates said adaptability using said correlation matrix.

26. (Original) The radio communication apparatus according to claim 25, wherein said adaptability function calculation section obtains adaptability including a first function value and a second function value which is different from said first function value from an eigenvalue of said correlation matrix.

27. (Original) The radio communication apparatus according to claim 26, wherein said first function value indicates reception quality, said second function value indicates said spatial spread, and said setting section sets said transmission format according to a result of a comparison between said spatial spread and a threshold which changes in conjunction with said reception quality.

28. (Original) The radio communication apparatus according to claim 24, wherein said detection section further comprises a generation section that generates a correlation vector for said each divided band based on said correlation value, and said adaptability function calculation section uses said correlation vector to calculate said adaptability.

29. (Canceled).

30. (Canceled).

31. (Currently Amended) A radio communication method for a radio communication apparatus comprising:

detecting, using a detection section, adaptability to spatial multiplexing transmission for each divided band, each divided band being obtained by dividing a communication band for multicarrier transmission and each divided band including a plurality of subcarrier signals; and

setting, using a setting section, for each divided band, a respective transmission format including a spatial multiplexing number used to carry out radio transmission based on the adaptability detected for said each divided band.

32-35. (Canceled).